

CLAIMS

WE CLAIM:

1. A middle ear prosthesis comprising:
2 a piston adapted to extend through an oval window when implanted in a
human ear;
4 a pair of jaws for engaging an ossicle when implanted in a human ear;
a spring coupled to the jaws for biasing the jaws toward one another to
6 provide clamping pressure; and
means for operatively connecting the jaws to the piston.
2. The middle ear prosthesis of claim 1 further comprising a swivel joint
2 coupling the spring to the pair of jaws.
3. The middle ear prosthesis of claim 2 wherein the swivel joint is
2 surrounded by an elastomer.
4. The middle ear prosthesis of claim 1 wherein each of the jaws
2 comprises a body having a semi-cylindrical inner surface.

2 5. The middle ear prosthesis of claim 4 wherein the spring comprises a
pair of flexible support arms each operatively coupled to an associated one of the jaws.

2 6. The middle ear prosthesis of claim 5 wherein each support arm has
one end received in an opening in the associated jaw and another end coupled to the piston.

2 7. The middle ear prosthesis of claim 1 wherein each support arm has
one end surrounding the body of the associated jaw and another end coupled to the piston.

2 8. The middle ear prosthesis of claim 1 wherein the spring is integrally
formed between the pair of jaws and is of a flexible material different from a material of the
jaws.

2 9. The middle ear prosthesis of claim 8 wherein the connecting means
comprises a wire operatively connected to one of the jaws and to the piston.

2 10. The middle ear prosthesis of claim 9 further comprising a second wire
connected to the other jaw so that the wires can be squeezed together to open the jaws.

11. The middle ear prosthesis of claim 1 further comprising a spacer to
2 temporarily hold the jaws in an open position until implanting in a human ear is completed.

12. The middle ear prosthesis of claim 1 wherein the spring is of a
2 biocompatible material.

13. The middle ear prosthesis of claim 1 wherein the spring is of a
2 material selected from titanium or stainless steel.

14. The middle ear prosthesis of claim 1 wherein the piston is of a
2 biocompatible material.

15. The middle ear prosthesis of claim 1 wherein the piston is of a
2 material selected from titanium or PTFE.

16. The middle ear prosthesis of claim 1 wherein the jaws are of a
2 bioactive material.

17. The middle ear prosthesis of claim 1 wherein the jaws are of
2 hydroxylapatite.

18. A self crimping ossicular prosthesis comprising:

2 a piston adapted to extend through an oval window when implanted in a
human ear;

4 a pair of jaws of a bioactive material each comprising a body having a semi-
cylindrical inner surface for engaging opposite sides of an ossicle when implanted in a
6 human ear, to anchor to the ossicle;

a pair of flexible support arms each operatively coupled to an associated one
8 of the jaws and to the piston for biasing the jaws toward one another to provide clamping
pressure..

19. The self crimping ossicular prosthesis of claim 18 wherein each
2 support arm has one end received in an opening in the associated jaw to provide a swivel
joint and another end coupled to the piston.

20. The self crimping ossicular prosthesis of claim 19 wherein the swivel
2 joint is surrounded by an elastomer.

21. The self crimping ossicular prosthesis of claim 18 wherein each
2 support arm has one end surrounding the body of the associated jaw and another end coupled
to the piston.

2 22. The self crimping ossicular prosthesis of claim 18 further comprising
a spacer to temporarily hold the jaws in an open position until implanting in a human ear is
completed.

2 23. The self crimping ossicular prosthesis of claim 18 wherein the support
arms are of a material selected from titanium or stainless steel.

2 24. The self crimping ossicular prosthesis of claim 18 wherein the piston
is of a biocompatible material.

2 25. The self crimping ossicular prosthesis of claim 18 wherein the piston
is of a material selected from titanium or PTFE.

2 26. The self crimping ossicular prosthesis of claim 18 wherein the jaws
are of hydroxylapatite.

27. A self crimping ossicular prosthesis comprising:

2 a piston adapted to extend through an oval window when implanted in a
human ear;

4 a pair of jaws of a bioactive material each comprising a body having a semi-
cylindrical inner surface for engaging opposite sides of an ossicle when implanted in a
6 human ear, to anchor to the ossicle;

a spring element of a flexible material, different from the pair of jaws,
8 integrally coupled to the jaws for biasing the jaws toward one another to provide clamping
pressure; and

10 a support arm operatively coupled to one of the jaws and to the piston.

28. The self crimping ossicular prosthesis of claim 27 wherein the jaws
2 are spaced apart with the semi-cylindrical inner surfaces facing one another, and the spring
element is connected between the pair of bodies to define a substantially “C” shaped
4 attachment mechanism.

29. The self crimping ossicular prosthesis of claim 27 further comprising
2 a second arm connected to the other jaw so that the arms can be squeezed together to open
the jaws.

30. A self crimping ossicular prosthesis comprising:

2 a pair of jaws of a bioactive material each comprising a body having a semi-
cylindrical inner surface for engaging opposite sides of an ossicle when implanted in a
4 human ear, to anchor to the ossicle;

a spring element of a flexible material, different from the pair of jaws,
6 operatively coupled to the jaws for biasing the jaws toward one another to provide clamping
pressure; and

8 an actuator element operatively coupled to the spring element.

31. The self crimping ossicular prosthesis of claim 30 wherein the actuator
2 element comprises a piston adapted to extend through an oval window when implanted in
a human ear.

32. The self crimping ossicular prosthesis of claim 30 wherein the actuator
2 element comprises a transducer element.

33. The self crimping ossicular prosthesis of claim 32 wherein the
2 transducer element comprises one of a coil or a magnet of an electromagnetic actuator; or a
piezoelectric element.